

505 Precast/Prestressed Concrete Structures Quality Management Plan

505.1 505.1 Introduction

505.1.1 The purpose of the Precast/Prestressed Concrete Structures Quality Management Plan is to establish the procedures for becoming pre-qualified as a supplier of precast concrete barrier, cattle guards, noise wall components, drainage boxes, prestressed concrete bridge girders, “wet cast” circular pipe & pipe arch culverts, “dry cast” or “zero slump” circular pipe & pipe arch culverts and precast concrete box culverts. The Management Plan is to assure the Utah Department of Transportation that precast/prestressed concrete fabrication plants are capable of constructing quality concrete products. Only products produced by a pre-qualified supplier will be accepted and certified for UDOT use.

505.2 Pre-qualifications for Precast/Prestressed Concrete Suppliers

505.2.1 Applicants shall submit to the Quality Assurance (QA) Engineer, a letter requesting that it be designated as a pre-qualified supplier. The letter shall include the following:

505.2.2 Proof the fabrication plant producing precast/prestressed concrete products is currently certified as a pre-qualified supplier by the QA Section as outlined in section 505.3 of this document.

505.2.3 Name and phone number of the Quality Control (QC) Manager at each production location who may be contacted for scheduling of inspections and general information.

505.2.4 Signature of a representative having legal authority to bind the company.

505.2.5 The Precast/Prestressed Concrete Supplier agrees to:

505.2.5.1 Meet or exceed UDOT’s Standard Specifications, including all applicable ASTM and AASHTO specifications.

505.2.5.2 Make available to the QA Engineer or representative all records required by section 505.3 of this document when requested.

505.2.5.3 Prestressed concrete girder suppliers will maintain current certification through the Precast/Prestressed Concrete Institute(PCI).

505.2.5.4 Precast concrete suppliers, other than prestressed girder and concrete pipe manufacturers, will maintain current certification through the National Precast Concrete Association(NPCA).

505.2.5.5 Concrete pipe and pipe arch culvert suppliers, primarily using “dry cast” or “zero slump” manufacturing process, will maintain current certification through the American Concrete Pipe Association(ACPA)

505.2.5.6 Submit to a minimum of one QA section plant inspection per year in order to maintain certification as a pre-qualified supplier.

505.2.6 Notify QA Section 14 days prior to project startup and then 24 hours prior to fabrication of any product to be used on UDOT specification controlled projects.

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- 505.2.7 Submit mill test reports and all applicable material certifications to the QA Section and project engineer at time of shipment.
- 505.2.8 Notification of acceptance as a Pre-Qualified Precast/Prestressed Concrete Supplier will be made in writing by the QA Engineer.

505.3 Quality Assurance Section Plant Inspection Program

505.3.1 Acceptance as a Pre-qualified Supplier:

- 505.3.1.1 Description: A pre-qualified supplier will adhere to the guidelines set forth in section 505.3 of this document. Suppliers will pass a QA Section inspection, as stated in section 505.3.3, prior to acceptance as a pre-qualified fabrication plant. Each pre-qualified plant will be subject to, a minimum of, one QA Section plant inspection per year. Failure in one or more of the requirements listed in section 505.3.3 may result in an accelerated inspection program. Any additional failures to meet these minimum requirements will result in the disqualification of the plant as a pre-qualified supplier for a period of time not to exceed one year. The supplier may apply for reinstatement as a pre-qualified supplier no sooner than six months after the initial suspension. At this time the supplier will be allowed to start the re-qualification process and work towards becoming a pre-qualified supplier of precast/prestressed concrete products.

505.3.2 Supplier QC Policies and Procedures:

- 505.3.2.1 Description: Provide adequate training to familiarize all pertinent employees with the company's QC procedures. Have a written company QC policy statement, UDOT's "Steel and Concrete Construction Manual" and a QC manual which includes, at a minimum, the plant certification technical criteria set forth in this document. Each pertinent employee shall receive a copy of all three. Have a designated Quality Inspector (QI) (see section 505.3.3.1.B) present on every work shift. These individuals must be properly trained and thoroughly familiar with all required QC procedures. In addition the QI shall have the authority to fully enforce the procedures.
- 505.3.2.2 *Commentary:* The ultimate success in achieving a quality product is heavily dependent upon the company's and employee's commitment and the employee's understanding of the company's QC procedures. In order to successfully implement and enforce compliance with the company's QC policies, a QI should report to an individual with the authority and knowledge to oversee plant operations.

505.3.3 Supplier Plant Requirements:

- 505.3.3.1 QC Procedures:
- a) Develop, periodically review and update as necessary, a company QC policy statement and manual. The QC Manual must be approved by the QA Engineer prior to acceptance as a pre-qualified supplier.
 - b) Designate a QI for every work shift. Precast and Pipe suppliers QI must be WAQTC Concrete Field Technician certified. Prestress suppliers QI must be PCI Level I certified. The QI must be present during stressing operations, final rebar inspection, all concrete placements, and final inspection prior to shipment.
 - c) Precast and Pipe suppliers QC Manager must be WAQTC Concrete Field Technician certified. Prestress suppliers QC Manager must be PCI Level II certified.
 - d) Suppliers batch plant or off-site ready-mix batch plants must be pre-qualified under UDOT's "Quality Management Plan: Ready-Mix Concrete".
 - e) Provide necessary training to designated QI and line personnel. QI shall have ready access to the latest company QC Manual.
 - f) Conduct meetings with the plant manager or designated representative and QC personnel, a minimum of once every three months to review the plant's QC procedures, discuss possible changes and implement any procedural changes.

- g) The plant manager or designated representative shall review and evaluate the QC techniques of all QI once every six months to assure compliance with QA Section guidelines and certification procedures.
- h) Submit to a minimum of one plant inspection, each year, by a QA Section Inspector.
- i) Formally consider and address each deficiency noted in the QA Section inspection reports and conduct subsequent follow-up meetings to assure compliance.

505.3.3.2 Required QC Records:

- a) Employee's current WAQTC and PCI ,when applicable, certification documents and QC training records.
- b) Maintain a written "new employee" training and/or orientation policy in the company files.
- c) Keep copies of the plant's QC policy statement, QC manual and UDOT's "Steel and Concrete Construction Manual" on file.
- d) Proof of current PCI (prestressed girder) ACPA (Pipe Products) or NPCA (precast products) certification.
- e) Complete QC inspection checklist, signed by the QI, for each work shift. Linear QC charts for air, slump, unit weight and concrete temperature for all units/lots produced for UDOT projects.
- f) Minutes of meetings held between the plant manager and QC personnel.
- g) Plant manager's evaluation of the QI performance of job duties.
- h) Memorandum signed by the plant manager, that details the plants response and follow-up to each specified deficiency documented during a QA Section inspection.

505.3.3.3 Responsible Person(s): Legally binding authority of the supplier.

505.3.4 Calibration and Certification of Test Equipment.

505.3.4.1 Description: All testing equipment or devices used for measuring material quantities shall be in good repair, calibrated and certified as specified in AASHTO, ASTM, and the UDOT Standard Specifications.

505.3.4.1.1 Supplier Plant Requirements:

- a) Maintain certification of beams, scales, water meters and moisture probes at the batch plant as per UDOT Standard Specifications.
- b) If the supplier chooses to use an off-site Ready-Mix concrete supplier, the supplier must maintain a copy of the Ready-Mix company's batch plant certification records for beams, scales, water meters and moisture probes.
- c) Maintain certification of air meters, unit weight buckets, slump cones, plastic concrete cylinder molds & rods, and thermometers.
- d) Any broken or malfunctioning equipment must be removed from service immediately and replaced with new or repaired/recalibrated equipment.
- e) Use UDOT approved laboratories for concrete compressive strength tests which are used for prestressed girder release breaks or any informational concrete compressive strength tests. A list of UDOT approved

laboratories can be obtained through the UDOT QA Section(see section 505.2.3).

505.3.4.1.2 Required Records:

- a) Notation on inspection checklist documenting which test equipment was used on each shift and their corresponding certification dates.
- b) Documentation proving the plant laboratory or the contract laboratory is UDOT approved.

505.3.4.2 Responsible Person: QI.

505.3.5 QA Section Inspector Guidelines:

505.3.5.1 Pre-qualification Inspection: The QA Section inspector will make a plant inspection visit at the request of the supplier. At that time the inspector will check the plant in accordance with the requirements of this document. Upon completion of the inspection the QA Engineer will recommend one of the following:

- a) **Certification** as a pre-qualified precast/prestressed fabrication plant.
- b) **Non-Compliance** as a pre-qualified plant. The QA inspector will submit a written report to the fabricator outlining all deficiencies observed during the plant inspection process. The fabricator is required to address all deficiencies noted in the QA inspectors report, at which time the fabricator may request another pre-qualification inspection.

505.3.5.2 Maintenance of Pre-qualification Status: The QA Section inspector will make a minimum of one plant inspection visit per year. At that time the inspector will check the plant in accordance with the requirements of this document. In addition, the QA Section inspector will periodically review UDOT materials sampling and testing records for compliance with UDOT Standard Specifications. Upon completion of the inspection and records review the QA Engineer will recommend one of the following:

- a) **Certification** as a pre-qualified precast/prestressed fabrication plant.
- b) Placement on the **Accelerated Plant Inspection** Program. Failure to consistently meet UDOT standard specifications may constitute placement on the Accelerated Plant Inspection Program. Also, any violations found during a routine inspection must be addressed within 30 days of notification. The supplier must submit a letter to the QA Engineer outlining the corrective action taken for each violation within the aforementioned 30 days. Failure to do so may constitute placement on the Accelerated Plant Inspection Program.
- c) **Disqualification** as a pre-qualified supplier. Violations documented during the accelerated plant inspection program would constitute Disqualification as a pre-qualified supplier.

505.3.5.3 Accelerated Inspection Program: The accelerated inspection program will be carried out for one year at a minimum frequency of one inspection visit per month during production. If a supplier continues to violate the requirements of section 505.3 of this document, the supplier will be eliminated as an pre-qualified supplier for a period of time not to exceed one year. The supplier may apply for reinstatement as a pre-qualified supplier no sooner than six months after the initial suspension. At this time the supplier will be allowed to start the re-qualification process and work towards becoming a pre-qualified supplier of precast/prestressed concrete products.

505.3.5.4 Dispute Resolution: Suppliers wishing to appeal a suspension from the pre-qualified supplier list may file a formal complaint with the QA Engineer. The appeal will be heard by a three person panel consisting of industry, UDOT materials or construction representative and an outside arbitrator acceptable to all parties. The independent panel will be named by the QA Engineer in cooperation with industry representatives. The panels decision is final.

505.3.5.5 QA Section Inspector Check List:

- C Examine the plants QC Policy Statement and Manual.
- C Verify that the plant has a copy of UDOT's "Steel and Concrete Construction Manual" on file.
- C Review the distribution of QC Policy Statement and manual and its availability to employees.
- C Review QC training records.
- C Review the plant records to confirm that a QI has been assigned to each work shift and has signed the inspection checklist.
- C Interview the person(s) responsible for QC policies and procedures.
- C Verify the QI lines of authority.
- C Examine the plant's equipment certification records.
- C Review QC inspection checklist for compliance.
- C Review QC linear control charts for compliance.
- C Inspect testing equipment for damage and ensure all equipment is in good repair.
- C Verify UDOT qualification of plant or consultant laboratory.
- Verify current NPCA or PCI plant certification
- C Verify concrete batch plant is pre-qualified under UDOT's "Quality Management Plan: Ready-Mix Concrete."

505.3.5.6 Responsible Person: QA Inspector.